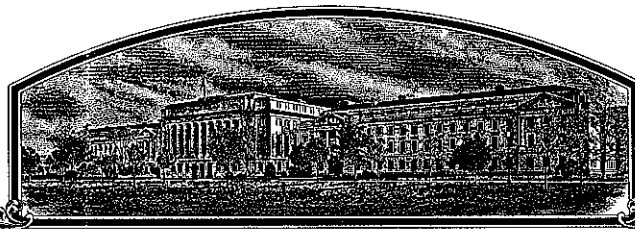


No.



9100006

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OF THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Siouxland 89'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 31st day of March in the year of our Lord one thousand nine hundred and ninety-five.

Attest:

Kenneth H. Evers
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Paul F. Whitman
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S) Texas Agricultural Experiment Station		2. TEMPORARY DESIGNATION		3. VARIETY NAME <i>per letter AAA</i> Siouxland 89 <i>10 Sep 1993</i>	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) College Station, TX 77843		5. PHONE (Include area code) 409-845-8484		FOR OFFICIAL USE ONLY PVPO NUMBER 9100006	
6. GENUS AND SPECIES NAME Triticum aestivum L. Thell		7. FAMILY NAME (Botanical) gramineae		FILING DATE <i>October 10, 1990</i> TIME <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
8. KIND NAME Wheat		9. DATE OF DETERMINATION <i>June 15, 1988 per AAA 10 Sept 1993 letter</i>		AMOUNT FOR FILING \$ <i>215.00</i> DATE <i>Aug. 30, 1990</i>	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Official Public Agricultural Research Agency of the State of Texas				AMOUNT FOR CERTIFICATE \$ <i>250.00</i> DATE <i>Feb. 17, 1995</i>	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION				12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. Paul G. Sebesta Texas Foundation Seed Service College Station, TX 77843-2581 PHONE (Include area code): 409-845-4051					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED					
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)					
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.					
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)					
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.					
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input checked="" type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input type="checkbox"/> No					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> Foundation <input checked="" type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S. <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT <i>Paul G. Sebesta</i>				DATE <i>8-24-90</i>	
SIGNATURE OF APPLICANT				DATE	

Exhibit A. Origin and Breeding History of Siouxland 89

<u>Year</u>	<u>Location</u>	<u>Activity and Disposition of Seed</u>
1984	Vernon, Texas	Nebraska Breeder Seed planted at the Texas Agricultural Experiment Station for production of Foundation Seed. Inspection revealed off-types too numerous for approval by state seed inspector.
1985	Vernon, Texas	3,000 headrows grown. Approximately 1,000 headrows which appeared uniform were harvested. Seed and spike samples were examined for uniformity and 297 headrows were retained.
1986	Vernon, Texas	297, 4-row observation plots were grown in the field.
1986	Dallas, Texas	Sublines harvested in spring at Vernon were tested for leaf rust resistance. Sublines composited in Vernon after leaf rust testing.
1987 -	Vernon, Texas	Siouxland 89 included in Texas uniform field performance tests.
1988-89	Texas and Nebraska	Siouxland 89 included in uniform performance tests. Breeder seed released to Foundation Seed Service in Texas and Nebraska.
1990		Foundation seed distributed to producers.

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Exhibit B. Novelty Statement

The variety Siouxland, from which Siouxland 89 was derived, was polymorphic for photoperiod response and leaf rust resistance. Genetic differences for photoperiod were not seen in Nebraska due to its latitude but were very evident in Texas. In Breeder Seed lots, Texas Department of Agricultural Field Inspectors also found unacceptably high numbers of plants with brown or red chaff and with long beak length. Siouxland 89 is similar to Siouxland but is unique from Siouxland in its absence of previously described aberrant plants. Siouxland 89 also is unique from Siouxland in its composition of genes for leaf rust resistance. Frequencies of specific LR genes are different between the two varieties.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

FOR OFFICIAL USE ONLY

PVPO NUMBER

91000006

VARIETY NAME OR TEMPORARY
DESIGNATION

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. 089 or 09) when number is either 99 or less or 9 or less.

1. KIND:

11 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

21 = SPRING 2 = WINTER 3 = OTHER (Specify) _____ 21 = SOFT 3 = OTHER (Specify)
2 = HARD

11 = WHITE 2 = RED 3 = OTHER (Specify) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

03 NO. OF DAYS EARLIER THAN 21 = ARTHUR 2 = SCOUT 3 = CHRIS
 NO. OF DAYS LATER THAN 4 = LEMHI 5 = HUGAINES 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

088 CM. HIGH
 CM. TALLER THAN 21 = ARTHUR 2 = SCOUT 3 = CHRIS
03 CM. SHORTER THAN 24 = LEMHI 5 = HUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

31 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHUR COLOR:

11 = YELLOW 2 = PURPLE

8. STEM:

1Anthocyanin: 1 = ABSENT 2 = PRESENT 2Waxy bloom: 1 = ABSENT 2 = PRESENT
1Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT 1Internodes: 1 = HOLLOW 2 = SOLID
04 NO. OF NODES (Originating from node above ground) CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

1Anthocyanin: 1 = ABSENT 2 = PRESENT 1Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

2Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 1Flag leaf: 1 = NOT TWISTED 2 = TWISTED
3 = OTHER (Specify): _____
1Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT 2Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
MM. LEAF WIDTH (First leaf below flag leaf) CM. LEAF LENGTH (First leaf below flag leaf):

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11. HEAD:

☒ 1 Density: 1 = LAX 2 = DENSE

☒ 1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
4 = OTHER (Specify) _____

☒ 4 Awedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

☒ 1 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED
5 = BROWN 6 = BLACK 7 = OTHER (Specify) _____

 0 6 Actual 6.3
CM. LENGTH

 0 8 Actual 7.7
MM. WIDTH

12. GLUMES AT MATURITY:

☒ 1 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.)
3 = LONG (CA. 9 mm.)

☒ 2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.)
3 = WIDE (CA. 4 mm.)

☒ 3 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
4 = SQUARE 5 = ELEVATED 6 = APICULATE

☒ 3 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

☒ 1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

☒ 1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

☒ 1 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

☒ 3 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

☒ 2 Check: 1 = ROUNDED 2 = ANGULAR

☒ 2 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

☒ 1 Brush: 1 = NOT COLLARED 2 = COLLARED

☐ Phenol reaction: 1 = IVORY 2 = FAWN 3 = LT. BROWN
(See instructions): 4 = BROWN 5 = BLACK

☒ 3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

 0 6 Actual 6.4
MM. LENGTH

 0 3 MM. WIDTH

 2 8 GM. PER 1000 SEEDS
17. SEED CREASE: Midwide, angular, shallow
☐ Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 80% OR LESS OF KERNEL 'CHRIS'
3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

☐ Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
2 = 35% OR LESS OF KERNEL 'CHRIS'
3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☒ 2 STEM RUST (Races) ☒ 2 LEAF RUST (Races) ☐ 0 STRIPE RUST (Races) ☐ 0 LOOSE SMUT
☒ 2 POWDERY MILDEW ☐ 0 BUNT ☐ OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 SAWFLY ☐ 0 APHID (Bydv.) ☒ 1 GREEN BUG ☐ 0 CEREAL LEAF BEETLE
☐ OTHER (Specify) _____ HESSIAN FLY RACES: ☐ GP ☐ A ☐ B ☐ C
☐ D ☐ E ☐ F ☐ G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Siouxland	Seed size	Siouxland
Leaf size	Siouxland	Seed shape	Siouxland
Leaf color	Siouxland	Coleoptile elongation	Siouxland
Leaf carriage	Siouxland	Seedling pigmentation	Siouxland

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan shall be used to determine the leaf color of the described variety.

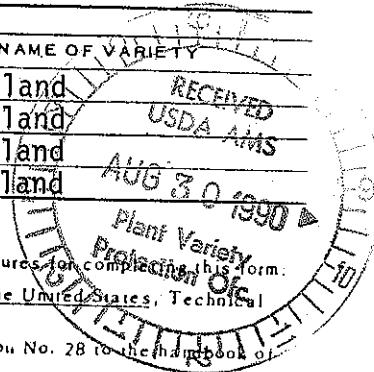


Exhibit D. Additional Description of Variety

Siouxland 89 is an awned, semidwarf hard red winter wheat variety which closely resembles the variety Siouxland in appearance and performance. It is a composite of reselections from Siouxland which has the pedigree (Warrior*5/Agent)*2//Karkaz. Siouxland 89 is resistant in Texas to field races of powdery mildew and some races of leaf rust. It is susceptible to Hessian fly, greenbug and Russian wheat aphid. Siouxland 89 retains the Siouxland name at the request of the University of Nebraska - Department of Agronomy.



Texas Agricultural Experiment Station

The Texas A&M University System
Agricultural Research and Extension Center
at Vernon

9100006

P.O. Box 1658
11708 Highway 70 South
Vernon, Texas 76385
817/552-9941
FAX 817/553-4657

June 30, 1994

Mr. Robert Dose
Technology Licensing Office
310 Wisenbaker
College Station, TX 77843-3369

Dear Mr. Dose:

In response to the letter from Mr. Allen Atchley regarding additional information for the PVP application for Siouxland 89 and based upon our conference call of 16 June with Mr. Atchley, I offer the following points of clarification:

1. All individual plants in Siouxland 89 are resistant to Puccinia recondita Roberge ex Desmaz., the causal agent of leaf rust.
2. Siouxland 89 is morphologically uniform for maturity, height, heading, chaff color and disease reaction.
3. Siouxland 89 is uniform and stable in its response to photoperiod.
4. Siouxland 89 is uniform and stable for grain and glume characteristics.
5. Siouxland 89 is more genetically uniform than Siouxland. It is not a multiline.

I believe these are the points which Mr. Atchley felt needed to be clarified prior to further processing of our PVP application. Please accept my apologies for the previous ambiguities and relay my apologies to Mr. Atchley.

Sincerely,

W. David Worrall
Professor

WDW:ls



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TEXAS AGRICULTURAL EXPERIMENT STATION
AGRICULTURAL RESEARCH AND EXTENSION CENTER

Vernon

MEMORANDUM

TO: Paul Sebesta, Manager
Texas Foundation Seed

FROM: W. David Worrall
Small Grains Breeder

DATE: March 22, 1993

SUBJECT: Response to PVP Office Concerning Siouxland 89

Listed below are my responses to questions raised about our application for plant variety protection for Siouxland 89. Most, if not all, these points were covered in the original application and supporting documentation.

1. Date of Determination - June 15, 1988
2. Variety Name - Siouxland 89
3. Progenitors of Siouxland 89.

Siouxland 89 was derived from a composite of selections of the variety Siouxland. Siouxland bears the pedigree (Warrior *5/Agent)*2//Kavkaz. Consequently, the progenitors of Siouxland 89 are, most immediately, Siouxland and, through the breeding history of Siouxland, a fixed line with the pedigree Warrior*5/Agent which was crossed to the variety Kavkaz. The F1 of this cross was backcrossed to Warrior*5/Agent.

Siouxland 89 first entered field performance tests in 1987 and has been tested annually throughout the Great Plains since. It has remained genetically stable through six years of evaluations.

4. Breeding History (Exhibit B)

Three thousand individual spikes of Siouxland were randomly selected at Vernon, Texas in 1984. These were grown in the field at Vernon in 1985 and rows were harvested which were phenotypically uniform. Whole-plant subsamples of each harvested row were analyzed visually for uniformity of glume characteristics and grain uniformity. Of the 1,000 harvested headrows, 297 were retained for further evaluations. In 1986, the 297 retained headrows were evaluated in the field at Vernon. Concurrently, seedlings

Paul Sebesta
Page 2
March 22, 1993

were evaluated at Dallas, TX for response to 4 races of leaf rust (Puccinia recondita). The 4 races and their associated virulences were MBB (Lr1, 3,10); MDB (Lr 1,3,10,24); MCB (Lr 1,3,10,26); and MFB (Lr 1,3,10,24,26). Four of the selections were susceptible to all 4 races while 20 selections were susceptible to MDB and MCB but resistant to MBB and MFB. Eighty-four additional selections were susceptible only to MFB. The 20 selections resistant to MBB and MFB and 37 of the selections resistant to MBB, MDB and MCB, all of which were phenotypically uniform, were combined to form Siouxland 89. Siouxland 89 is most similar to the hard red winter wheat variety Siouxland. Its novelty, compared to Siouxland, is two-fold. First, Siouxland was polymorphic for leaf rust resistance. Siouxland 89 has a well-documented array of specific genes for resistance to leaf rust. Secondly, Siouxland varies in its response to photoperiod whereas Siouxland 89 does not. Finally, Siouxland 89 expresses a much greater degree of homogeneity for glume and grain characteristics.

5. Color Type of Siouxland 89

Siouxland 89, like Siouxland, meets all the criteria listed by the Federal Grain Inspection Service for classification as a hard red winter wheat.

6. Milling and Baking Quality of Siouxland 89.

Attached to this memo are data reported by the USDA Hard Winter Wheat Quality Laboratory in Manhattan, KS from grain produced in the 1991 crop year.

WDW:mss

Table V. Texas Uniform Wheat Advanced I Nursery (1991).

USGMRL No.	Nursery Plot No.	Selection No.	Variety or Pedigree	Composites ^a
91-851	1	TAM W-101	CI15324	A
91-852	2	TAM-107	TAM-105*4/AMI	A
91-853	3	TAM-200	TX71A1039-V1*3/AMI	A
91-854	4	SIouxLAND 89	(WRR*5/AG)*2/KVZ	A
91-855	13	TXGH10440	(TAM-105*4/AMI)*4/LARGO	A
91-856	14	TXGH12588	(TX71A562-6*4/AMI)*4/LARGO	A
91-857	15	TX86A5616	(TX71A562-6*4/AMI)*3//LARGO/AMI	A
91-858	16	TX88A6441	WWP4394/TAM W-101	A
91-859	22	TX87V4039	TX84V1037HF	A
91-860	25	TX88V4226	NE7060/TX73V862	A
91-861	27	TX88V4618	TX78A3345/TAM-106	A
91-862	29	TX88V5017	AU/TX78V3630	A
91-863	31	TX88V5308	SXL/PONY	A
91-864	32	TX88V5321	TX69A569-1-69/TX78V2154	A
91-865	33	TX88V5408	TAM-107/TX81V6456	A
91-866	37	TX89V4213	CO723594/YACO"S"(SWM13203)//TX81V6582	A
91-867	39	TX89V4734	TX78V2231/TAM-107	A
91-868	40	TX89V5106	TAM-105/VEE"S"	A
91-869	19	TX88A674369	TX79A2729/CONCHO	A
91-870	17	TX88A648070	SXL/TAM W-101	B
91-871	18	TX88A653371	TX71A889/TAM W-101	B

^aA - blends of equal amounts (600 g) of lines grown at Bushland (dryland and irrigated), Chillicothe, Dallas, and Olney.

B - blends of equal amounts (600 g) of lines grown at Bushland (dryland), Chillicothe, Dallas, and Olney.

Table VI. Chemical and Milling Data for the Texas Uniform Wheat Advanced I Nursery Composites of Hard Winter Wheat Lines Harvested in 1991.^{a,b}

LINE	Wt/Bu ^c (lb)	1000 Kernel Weight (g)	Ash (%)	Pro- tein (%)	Kernel Sizing ^d			Hardness Score ^e			Flour Yield (%)	Milling Score ^f
					L (%)	M (%)	S (%)	NIR	USGMR SKHT	Millers' Subject.		
TAM W-101	59.6	29.0	1.41	13.3	48	52	0	66	78	6	73.2	80
TAM 107	59.7	26.3	1.31	12.8	43	56	1	75	82	6	73.6	82
TAM 200	61.8	21.2	1.39	12.7	21	77	2	45 Q	63	6	72.2	75
Siouxland 89	59.7	24.6	1.35	12.8	38	60	2	65	76	6	75.1	83
TXGH10440	60.9	26.7	1.31	12.7	60	39	1	71	75	6	74.0	81
TXGH12588	59.8	28.9	1.27	12.3	54	45	1	73	80	6	73.3	80
TX86A5616	59.8	27.3	1.31	12.4	49	50	1	74	78	6	73.6	80
TX88A6441	61.2	21.3	1.28	12.1	37	61	2	68	78	6	74.5	84
TX87V4039	62.1	29.0	1.26	12.7	49	50	1	70	75	6	73.7	79
TX88V4226	61.0	26.9	1.37	13.7	44	55	1	66	78	6	71.0	80
TX88V4618	61.4	23.8	1.37	13.4	22	77	1	74	73	6	74.8	85
TX88V5017	62.0	29.1	1.36	13.3	61	38	1	66	75	6	75.2	88
TX88V5308	60.3	21.2	1.36	13.0	17	80	3	70	79	6	74.8	80
TX88V5321	58.3	25.1	1.35	12.5	40	58	2	60	72	6	73.1	76
TX88V5408	61.4	24.9	1.28	12.4	47	52	1	71	74	6	74.3	76
TX89V4213	61.7	22.6	1.29	11.8	34	64	2	60	76	6	73.4	81
TX89V4734	60.8	25.8	1.29	12.7	51	48	1	81	81	6	73.4	81
TX89V5106	59.9	26.5	1.52	12.5	51	47	2	77	81	6	72.4	81
TX88A6743	55.0 Q	22.2	1.37	12.6	30	68	2	67	85	6	73.1	86
TX88A6480	56.3	30.3	1.33	11.8	64	35	1	66	80	6	72.1	84
TX88A6533	55.4	26.2	1.37	11.7	36	60	4	67	82	6	71.4	83
(Average)	(59.9)	(25.7)	(1.34)	(12.6)	(43)	(56)	(1)	(68)	(77)	(6)	(73.4)	(81)

^aData expressed on a 14% moisture basis.

^bS, Q, U = satisfactory, questionable, and unsatisfactory quality with respect to property in question. A satisfactory rating is inferred in the absence of a designated one.

^cWt/Bu = weight per bushel.

Table VI. (Continued)

^dL = large kernels (overs of Tyler #7); M = medium kernels (overs of Tyler #9); S = small kernels (thrus of Tyler #9).

^eWheat hardness scores were determined by NIR (Dickey John, Instalab 600) of bulk samples and by the USGMRL Single Kernel Hardness Tester (SKHT) of each kernel: the higher the value, the harder the wheat sample. Miller's Subjective Scores: 1-3 - too soft, unacceptable for hard wheat milling; 4-7 - acceptable for hard wheat milling (4 - softer than average; 5-7 - average; 8-10 - harder than average, would lengthen grinding time and could cause reduction in flour quality.

^fMilling scores (MS) were derived from test weight (TW), flour yield (FY), and the ash and protein conversions.
 $MS = 100 - ((TW - 60) + (82 - FY) + 100 (FA - WA/3.9) + 10 [(WP - 1) - FP])$; FA = flour ash; WA = wheat ash;
 FP = flour protein; WP = wheat protein.

91000006

Table VII. Chemical and Mixograph Data for the Texas Uniform Wheat Advanced I Nursery Composite Flours of Hard Winter Wheat Lines Harvested in 1991.^{a,b}

LINE	FLOUR			Ab-sorp-tion (%)	MIXOGRAPH		Tolerance ^e
	Ash (%)	Pro-tein (%)	Color Value ^c		Mix Time ^d		
					As Rec'd (min)	Corr. (min)	
TAM W-101	.48	12.4	82	61.0	3.38	-	8
TAM 107	.44	11.8	80	62.3	3.50	3.42	8
TAM 200	.48	11.5	85	62.4	4.00	3.77	8
Siouxland 89	.45	11.8	83	60.8	3.75	3.67	8
TXGH10440	.42	11.5	83	61.4	3.38	3.19	8
TXGH12588	.43	11.2	83	62.5	4.00	3.60	8
TX86A5616	.43	11.2	82	62.5	4.00	3.61	8
TX88A6441	.41	11.2	84	64.0	4.38	3.98	8
TX87V4039	.41	11.5	83	63.9	4.00	3.78	8
TX88V4226	.40	12.4	84	63.0	4.38	-	8
TX88V4618	.42	12.5	81	63.2	4.63	-	8
TX88V5017	.41	12.6	84	63.4	3.50	-	8
TX88V5308	.45	11.8	84	59.3	3.13	3.06	8
TX88V5321	.47	11.1	83	57.3	2.75	2.45	7
TX88V5408	.44	11.1	83	56.8 Q	3.38	3.01	8
TX89V4213	.41	10.7	87	59.2	5.00	4.19	8
TX89V4734	.39	11.3	85	58.6	3.38	3.09	8
TX89V5106	.47	11.4	82	58.7	3.50	3.24	8
TX88A6743	.44	11.5	84	59.9	3.38	3.18	8
TX88A6480	.43	10.8	85	58.9	4.50	3.85	8
TX88A6533	.45	10.6	85	59.6	4.50	3.75	8
(Average)	(.43)	(11.5)	(83)	(60.9)	(3.83)	(3.56)	(7.95)

^aData expressed on a 14% moisture basis.

^bS, Q, and U = satisfactory, questionable, and unsatisfactory quality with respect to property in question. A satisfactory rating is inferred in the absence of a designated one. One unsatisfactory rating characterizes a variety as undesirable for hard winter wheat milling and breadmaking purposes.

^cColor values were obtained by an Agtron Photoelectric Colorimeter with a modified method (AACC Method 14-30) using flour samples rather than using slurry samples with Agtron certified calibration disks "63" for 0% setting and "97" instead of "85" for 100% setting.

^dMixing times for samples having less than 12% protein were corrected (Corr.) to 12% protein. (-) denotes the same mix time on as received (Rec'd).

^eMixing tolerance was rated with numbers: 8 for S; 7 for S-Q; 6 for Q; 5 for Q-U; and 4 for U.

Table VIII. Bread-Making Data for the Texas Uniform Wheat Advanced I Nursery Composite Flours of Hard Winter Wheat Lines Harvested in 1991. a, b

LINE	FLOUR		Ab- sorp- tion (%)	Mix Time ^c		Ascorbic Acid (ppm)	Crumb Grain ^d	Loaf Volume ^e		
	Pro- tein (%)	As Rec'd (min)		As Rec'd (min)	Corr. (min)			As Rec'd (cc)	Corrected to 11.5 P (cc)	Regres- sion (cc/%)
TAM W-101	12.4	64.1	3.63			50	6 Q	882	832	62
TAM 107	11.8	66.5	4.38		4.28	50	7	935	916	72
TAM 200	11.5	65.0	5.13		4.84	50	7	968	968	78
Siouxland 89	11.8	62.6	4.00		3.92	50	7	838	821	61
TXGH10440	11.5	65.2	4.00		3.77	50	7	898	898	70
TXGH12588	11.2	66.0	4.63		4.16	50	8	830	853	65
TX86A5616	11.2	65.7	4.50		4.06	50	8	972	999	82
TX88A6441	11.2	65.9	5.38		4.85	50	8	898	918	72
TX87V4039	11.5	65.8	4.50		4.25	50	7	905	905	71
TX88V4226	12.4	65.7	4.63		-	50	7	913	859	65
TX88V4618	12.5	64.9	5.75		-	50	8	945	945	68
TX88V5017	12.6	65.1	4.25		4.25	50	7	895	830	62
TX88V5308	11.8	63.4	4.13		4.04	50	6 Q	925	907	71
TX88V5321	11.1	57.5	3.25		2.90	50	5 Q-U	812	838	63
TX88V5408	11.1	61.1	3.88		3.45	50	7	908	939	75
TX89V4213	10.7	66.2	8.00		6.71	50	7	930	997	81
TX89V4734	11.3	64.0	3.63		3.32	50	6 Q	928	946	76
TX89V5106	11.4	64.4	4.63		4.28	50	7	876	887	69
TX88A6743	11.5	63.1	4.38		4.12	50	7	923	923	73
TX88A6480	10.8	65.1	6.38		5.46	50	7	935	991	81
TX88A6533	10.6	63.2	5.38		4.48	50	7	908	976	79
(Average)	(11.5)	(64.3)	(4.69)		(4.15)	(50)	(6.95)	(906)	(911)	(71)

^aData expressed on a 14% moisture basis. Flour protein contents were included in this table also for a reference.

^bS, Q, and U = satisfactory, questionable, and unsatisfactory quality with respect to property in question. A satisfactory rating is inferred in the absence of a designated one. One unsatisfactory rating characterizes a variety as undesirable for hard winter wheat milling and breadmaking purposes.

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Table VIII. (Continued)

^cMixing times for samples having less than 12% protein were corrected (Corr.) to 12% protein. (-) denotes the same mix time on as received (Rec'd).

^dCrumb grain was rated with numbers: 8 for S; 7 for Q-S; 6 for Q; 5 for Q-U; and 4 for U.

^eCorrected loaf volumes were calculated to the average flour protein (P) content (11.5%) of this sample set. Regression value serves as a descriptor of the loaf volume potential of the progeny.

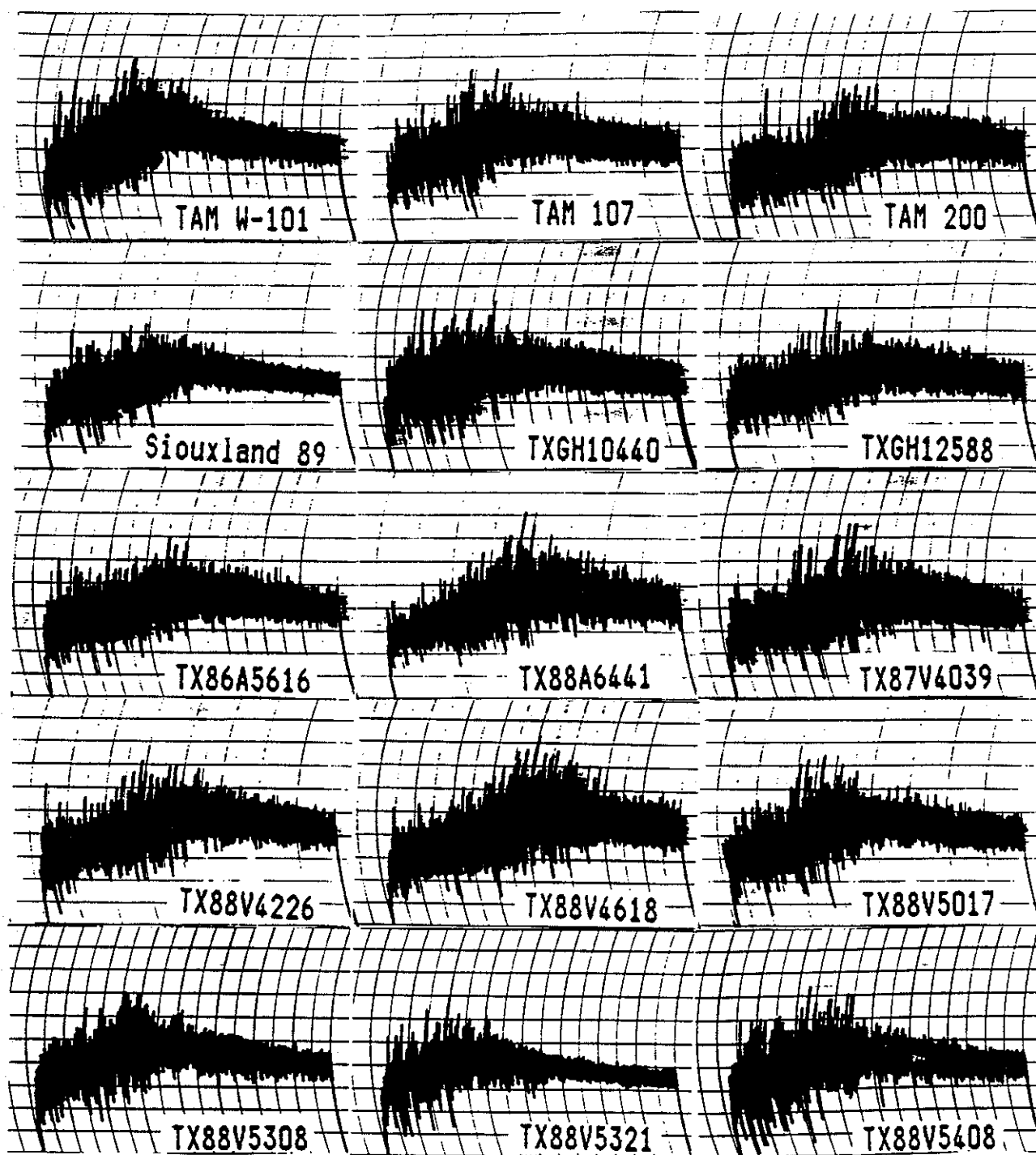


Fig. 4. Mixograms (10 g of flour) for the Texas Uniform Wheat Advanced I Nursery composites of hard winter wheat lines harvested in 1991. Mixing time is the time (min) to the peak. Mixing tolerance is the slope and width after the peak and stability of mixogram height on either side of the peak. Major arcs are at 1-min intervals.

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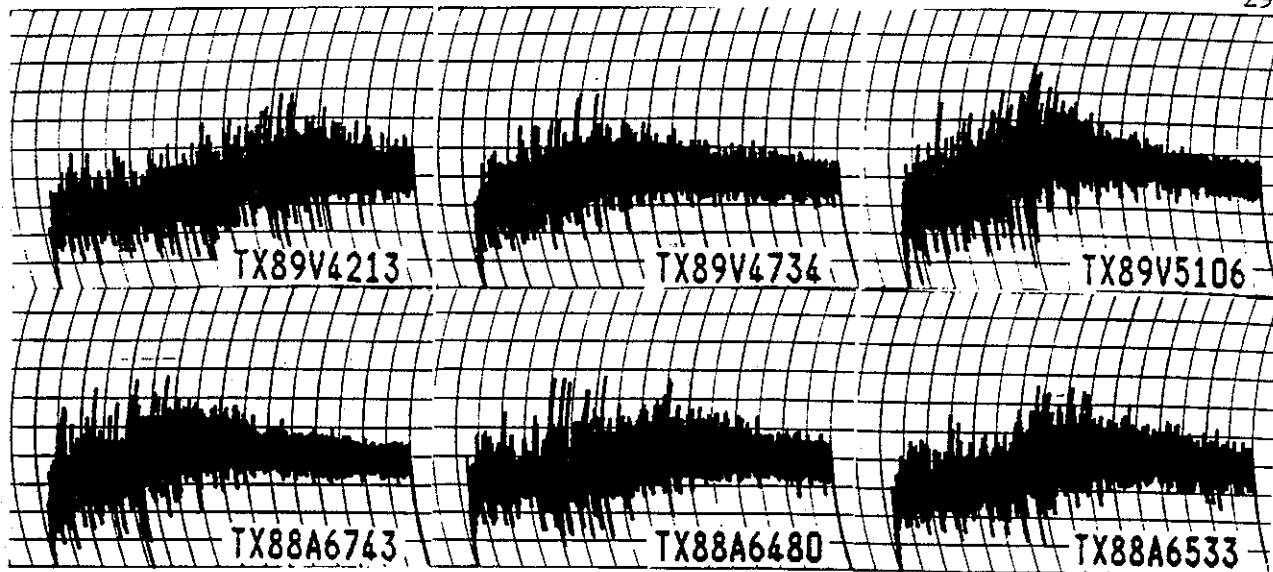


Fig. 4. (Continued)

Exhibit E. Statement of the Basis of Applicant's Ownership

Ownership of Siouxland 89 by the Texas Agricultural Experiment Station (TAES) is based on the fact that unique selections were made at TAES facilities at Vernon, Texas. TAES personnel performed all selection and testing activities prior to release for field performance evaluations in Nebraska. Initial Breeder Seed production was made by TAES.